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A NEW *EUREM-A* SPECIES FROM SOUTH INDIA (LEPIDOPTERA, PIERIDAE)

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Abstract

Eurema nilgin'ensis sp. nov. belonging to the sari subgroup is described from Nilgiri Hills, South India.

Introduction

In 1987, I found two males of an interesting *Eurema* form Nilgiri Hills, South India in E. Tsukada's collection. Two years later I also found the same form with some additional males and two females in K. Ohtsuka's collection. When I first saw the male specimens in Tsukada's collection, I thought that it might represent a subspecies of *Eurema andersoni*. However, later I knew that this form is sympatric with *E. andersoni* in Nilgiri Hills. Moreover, although they very closely resemble each other, there are constant differences in general appearance and the male genital structure. Based on these facts I regarded the form as a new species.

The new species is closely related to *E. andersoni, E. omistoni, E. celebensis* and *E. beatrix* and these five seem to form a monophyletic group (*andersoni* complex), which belongs to the *sari* subgroup (Y ata, 1990).

The following abbreviations are used for the descriptions and illustrations of the male genitalia and the hindwing venation. P1-P5: processes of valva of the male genitalia. P1: a process near the middle of ventral margin of costa+ampulla region. P2 : a process beyond the middle of dorsal margin of costa+ampulla region. P3 : apical process of valva. P4 : bifurcated process on the dorsal margin of harpe. P5 : a process arising distad of P4. *mdc* : veinlet between origins of veins 5 and 6. *ldc* : veinlet between origins of veins 4 and 5.

The following abbreviations are used for the type depositories.

BMNH : British Museum (Natural History), London.
ET : Collection of Mr. Etsuzo Tsukada, Tokyo.
KO : Collection of Mr. Kazuhisa Ohtsuka, Osaka.
KUCGE : Kyushu University, College of General Education, Fukuoka.

Before going further, I wish to thank Mr. Etsuzo Tsukada (Tokyo) and Mr. Kazuhisa Ohtsuka (Osaka) who gave me opportunities to examine the valuable materials. I am also much indebted to Professor Toyohei Saigusa (Kyushu University) for his critical reading of the manuscript.

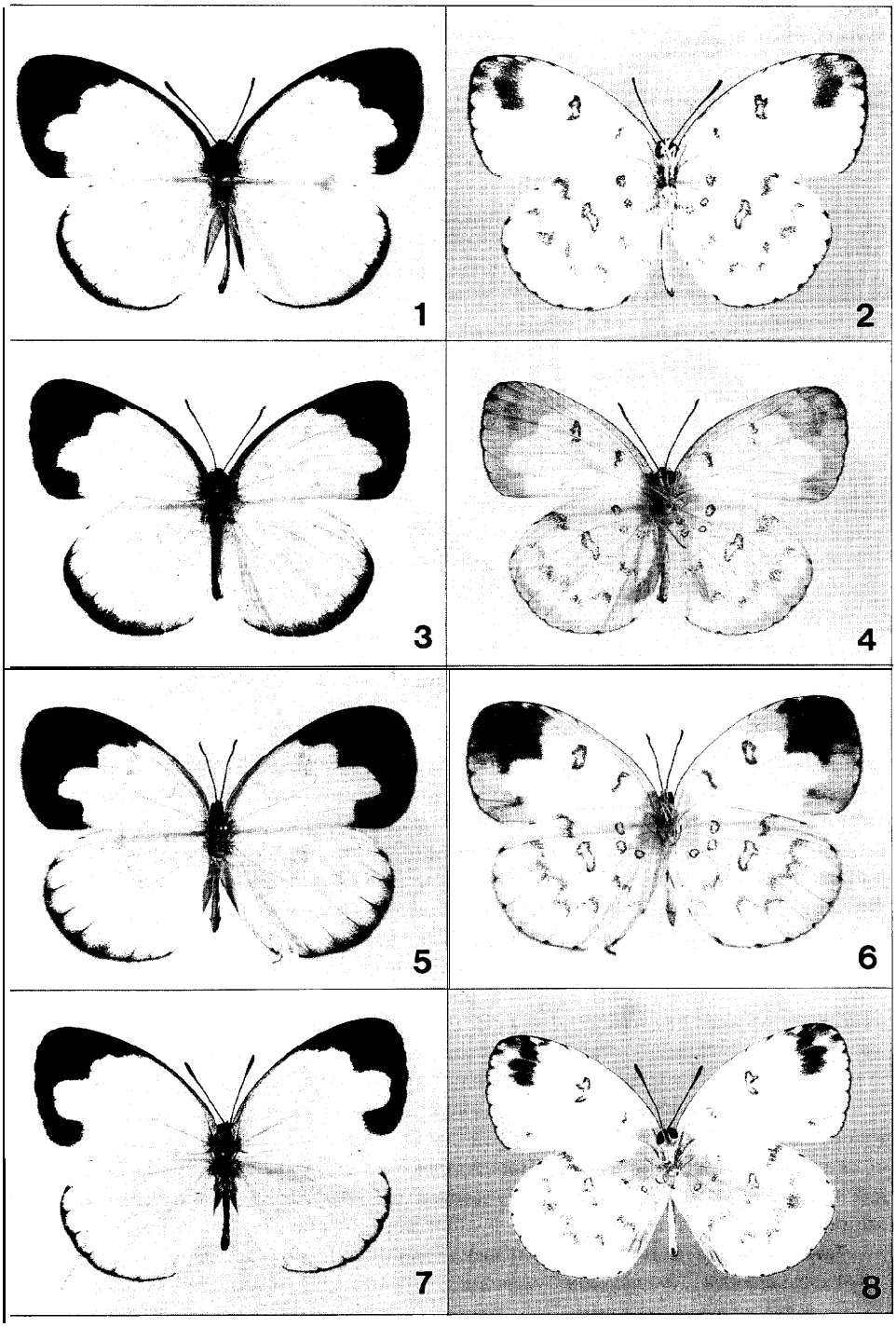
Eurema nilgiriensis Yata, sp. nov.

Male (Figs. **1-4**). *Upperside* : Ground colour yellow. Forewing black costal border broad with its inner margin sharply defined ; black distal border broad, with its inner edge more or less irregularly incurved from costa to vein 4, much obtuse-angled at vein 4, more deeply excavated in space 2 than in space 3, evenly concaved in each of spaces 2 and 3, almost perpendicular to hind margin or slightly inclined towards tornus in spaces la and 1b+c; black basal border undeveloped ; discocellular spot absent ; fringe black. Hindwing black distal border usually broad, tapering near apex and tornus, with its inner edge almost uniform and moderately defined, sometimes weakly and short projected along each vein ; anal border undeveloped ; fringe black, but mixed with yellow. Basal portions of both wings blackish. ***Underside*** : Ground colour somewhat paler than on upperside. Forewing apex with marginal black smudge usually very faint and subapical patch usually barely traceable, but these markings sometimes well developed and partially confluent with each other ; a 3-shaped spot in discoidal cell ; discocellular marking appearing as an irregular slender ring, covering more than half of the discocellular vein ; tornal spot absent ; sex-brand pale grey, short and narrow, ending before origin of vein 2 ; small vein-dots usually conjointed with a catenate black anticiliary line, but sometimes strongly developed and represented by a series of small marginal triangles ; fringe black. Hindwing with a series of submarginal spots in spaces 1 to 8 arranged in an irregular zigzag-line, those in spaces 4 to 8 usually larger and more diffused, and a submarginal spot in spaces 7 and 8 comma-shaped and directed to midway between submarginal spot in space 6 and discocellular spot ; circular subbasal spot usually present each in spaces 1 and 7 and in the middle of discoidal cell ; a minute basal spot absent ; discocellular spot almost same as in forewing but larger ; small vein-dots as in forewing; fringe yellow, but mixed with black. Forewing weakly angulate at apex ; distal margin slightly convex. Hindwing slightly arched in the basal half of costal margin ; distal margin evenly rounded or weakly angulate at vein 3 ; vein 7 usually stalked with vein 6, ***mdc*** about as long as 1/3 length of *ldc*. Antenna somewhat less than half the length of forewing, black and white-checkered, except on the posterodorsal surface and a few apical segments, club cylindrical. Thorax and abdomen yellow, much darkened above, clothed with black and yellow hairs on thorax and base of abdomen, a black longitudinal weak line appearing along the lateral margin of abdominal terga.

Forewing length : 16.5-20.0 mm (avg= 18.6 mm ; n= 10)

Male genitalia (Fig. 9) : Tegumen narrow, triangular in dorsal aspect, somewhat concaved dorsomedially, entirely sclerotized ; Valvenansatz short, usually producing downwards ; vinculum not strongly arched ; saccus moderately long (0.73 of ring height), angle between vinculum and saccus about 90°. Uncus long (dorsum proper 0.73 of ring height), extending strongly downwards; uncal projection short (0.1 of ring height), 'snake head'-shaped in lateral aspect, projecting posteriorly, with its apex weakly bicuspid. Valva almost as long as high ; P1 somewhat weakly sclerotized, shorter than P4, extending almost laterally ; P2 well developed ; a weak process produced posterodorsally between P2 and P3 ; P3 broad and triangular, with a pointed apex ; P4 represented by two processes, distal one of which is much longer than proximal one and more strongly curved ventrally. Phallus very long, slender and strongly arched dorsally, subzonal sheath about as long as 1/4 length of phallus. Juxta weakly sclerotized, consisting of a pair of broad concaved pouches and producing a short and slender median stalk.

Female (Figs. 5-6). *Upperside* : Ground colour pale lemon yellow. Forewing black costal border narrow and sometimes diffused, with its inner margin rather distinct ; black distal border fairly broad, with its inner edge oblique and uniform from costa to vein 4, strongly angled in the midway, almost right-angled at vein 4, more deeply excavated in space 2 than in space 3, and the excavations



Figs. l-6. *Eurema nilgiriensis* **Yata,** sp. nov. 1 : ♂ Holotype, Nilgiri Hills, 19-28. ix. 1980. 2 : Ditto, underside. 3 : ♂ Paratype, Nilgiri Hills, ix-x. 1980. 4 : Ditto, underside. 5 : ♀ Paratype, Nilgiri Hills, 15. x. 1980. 6 : Ditto, underside. 7-8 : ***E. andersoni sadanobui. 7*** : ♂, Nilgiri Hills, x-xi. 1977. 8 : Ditto, underside.

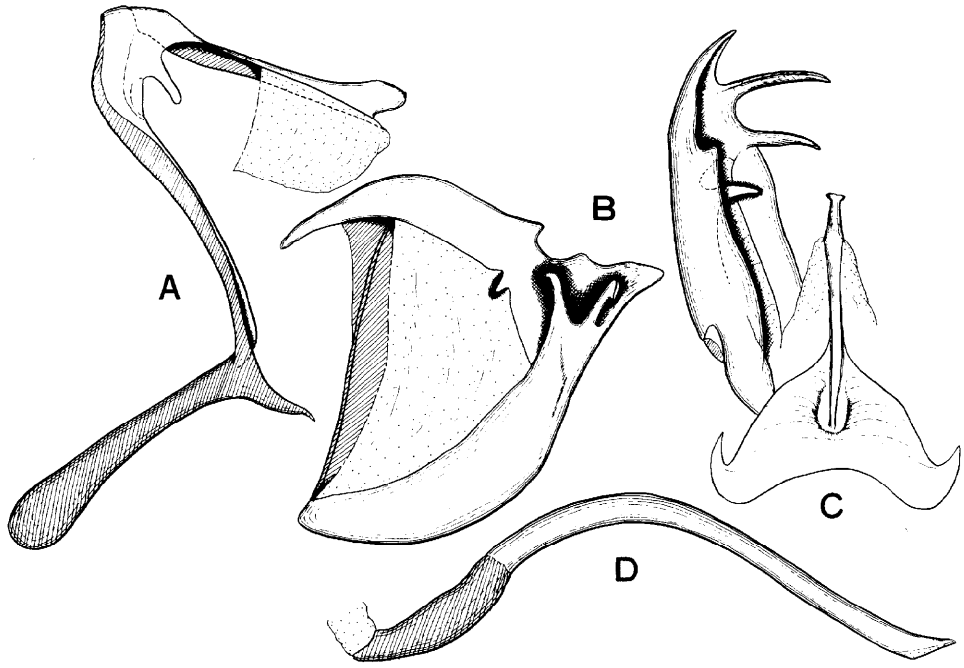


Fig. 9. Male genitalia of *Eurema nilgiriensis* sp. nov., Nilgiri Hills. A : Lateral aspect of ring. B : Inner aspect of right-hand valva. C : Dorsal aspect of dorsum and right-hand valva. D : Lateral aspect of phallus.

almost confluent with each other, almost perpendicular to hind margin in spaces la and lb+c ; black basal border undeveloped ; discocellular spot absent ; fringe black. Hindwing black distal border narrow, tapering near apex and tornus, with its inner edge zigzag-shaped, diffused, and distinctly projected along each vein ; anal border undeveloped ; fringe black, but mixed with yellow. Basal portions of both wings blackish. ***Underside*** : Ground colour somewhat paler than on upperside. Forewing with apical patch large, quadrate and entirely bright chocolate brown with luster ; a 3-shaped spot in discoidal cell ; discocellular marking appearing as an irregular slender ring, covering more than half of the discocellular vein ; faint tornal spot present or absent ; small vein-dots conjointed with a catenate black anticiliary line ; fringe black. Hindwing with a series of submarginal spots in spaces 1 to 8 arranged in an irregular zigzag-line, and a submarginal spot in spaces 7 and 8 zigzag-shaped and directed towards discocellular spot ; a circular subbasal spot present each in spaces 1 and 7 and in the middle of discoidal cell ; a minute basal spot absent ; discocellular spot almost same as in forewing but larger ; small vein-dots as in forewing ; fringe black but mixed with yellow.

Forewing rounded at apex ; distal margin well convex. Hindwing slightly arched in the basal half of costal margin ; distal margin evenly rounded ; venation, antenna, thorax and abdomen almost as in male.

Forewing length : 19.0 mm (avg = 19.0 mm ; n = 2)

TYPE-LOCALITY. Nilgiri Hills, South India.

GEOGRAPHICAL DISTRIBUTION. This new species is known only from Nilgiri Hills, South India.

HOLOTYPE : ♂, Nilgiri Hills, South India, 19-28. ix. 1980, Tsukada coll. [ET].

PARATYPES : S. INDIA, Nilgiri Hills: 1♂, 19-28. ix. 1980, Tsukada coll. [KUCGE], 1♀, ***15. x. 1977,*** Ohtsuka coll. [KUCGE] ; 8♂1♀, ix-x, 1980, Ohtsuka coll. [KO] [KUCGE] [BMNH].

REMARKS. *Eurema* ***nilgiriensis*** is distinguished from ***E.*** *andersoni* not only by external features, but also by the male genitalia as follows.

1) Inner margin of black distal border on forewing upperside much obtuse-angled at vein 4 in male and more deeply excavated in space '2 than in space 3, while in *andersoni* almost right-angled at vein 4 in male and more deeply excavated in space 3 than in space 2 (Figs. 7-8). 2) Inner edge of black distal border on hindwing upperside almost uniform in male, while in *andersoni* more or less zigzag-shaped. 3) Uncal projection of male genitalia 'snake head'-shaped in lateral aspect, while in *andersoni* almost triangular. 4) Valva producing well-developed P2 in addition to a weak dorsal process between P2 and P3, while in *andersoni* ***P2*** undeveloped.

The female of this new species was first figured by Ohtsuka (1980) as a subspecies of ***Eurema*** *sari*. In reality the female is quite similar to that of ***Eurema*** *sari* in bearing the large, entirely bright chocolate apical patch on the forewing underside. I concluded, however, that the female specimen figured by Ohtsuka did not belong to ***sari,*** but to ***nilgiriensis*** for the following reasons : 1) The wing markings are similar to those of males of ***nilgiriensis*** except in bearing the apical patch in the forewing underside, the forewing black distal border almost right-angled at vein ***4*** and the hindwing black distal border strongly zigzag-shaped. ***2)*** When compared with *sari,* the hindwing black distal border is much narrower and more strongly zigzag-shaped, and its inner edge is distinctly projected along each vein. 3) The female genital structure more closely resembles that of *andersoni* than of ***sari.*** 4) The female in question was collected together with many males of ***nilgiriensis*** in the same season and same collecting site.

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